

.. e se 1.000.000
scienziati
assistessero al
vostro seminario
scientifico?



Sdu

E.Canessa, C.Fonda and M. Zennaro
the Abdus Salam International Centre for Theoretical Physics
Science Dissemination Unit
sdu@ictp.it

I'ICTP

fondato nel 1964, il Centro Internazionale di Fisica Teorica "Abdus Salam" (ICTP) fa parte dell'Organizzazione delle Nazioni Unite per l'Educazione, la Scienza e la Cultura (UNESCO) e dell'Agenzia Internazionale per l'Energia Atomica (IAEA).



Abdus Salam (right) and Paolo Montagna (left) in the 1960 seminar that spurs the creation of ICTP. Abdus Salam, while visiting at Imperial College in London, is on the right. Paolo Montagna, organizer of the seminar, is to his immediate right.

la missione

Contribuisce al progresso degli studi avanzati e della ricerca nelle scienze fisiche e matematiche, soprattutto a beneficio dei ricercatori dei paesi in via di sviluppo.

Favorisce i contatti e lo scambio di idee e informazioni fra gli scienziati provenienti da tutte le nazioni.

Mette a disposizione dei visitatori, dei membri associati e dei titolari di borse di studio le strutture necessarie a un'attività di ricerca autonoma e originale.



statistiche

L'ICTP ospita ogni anno:

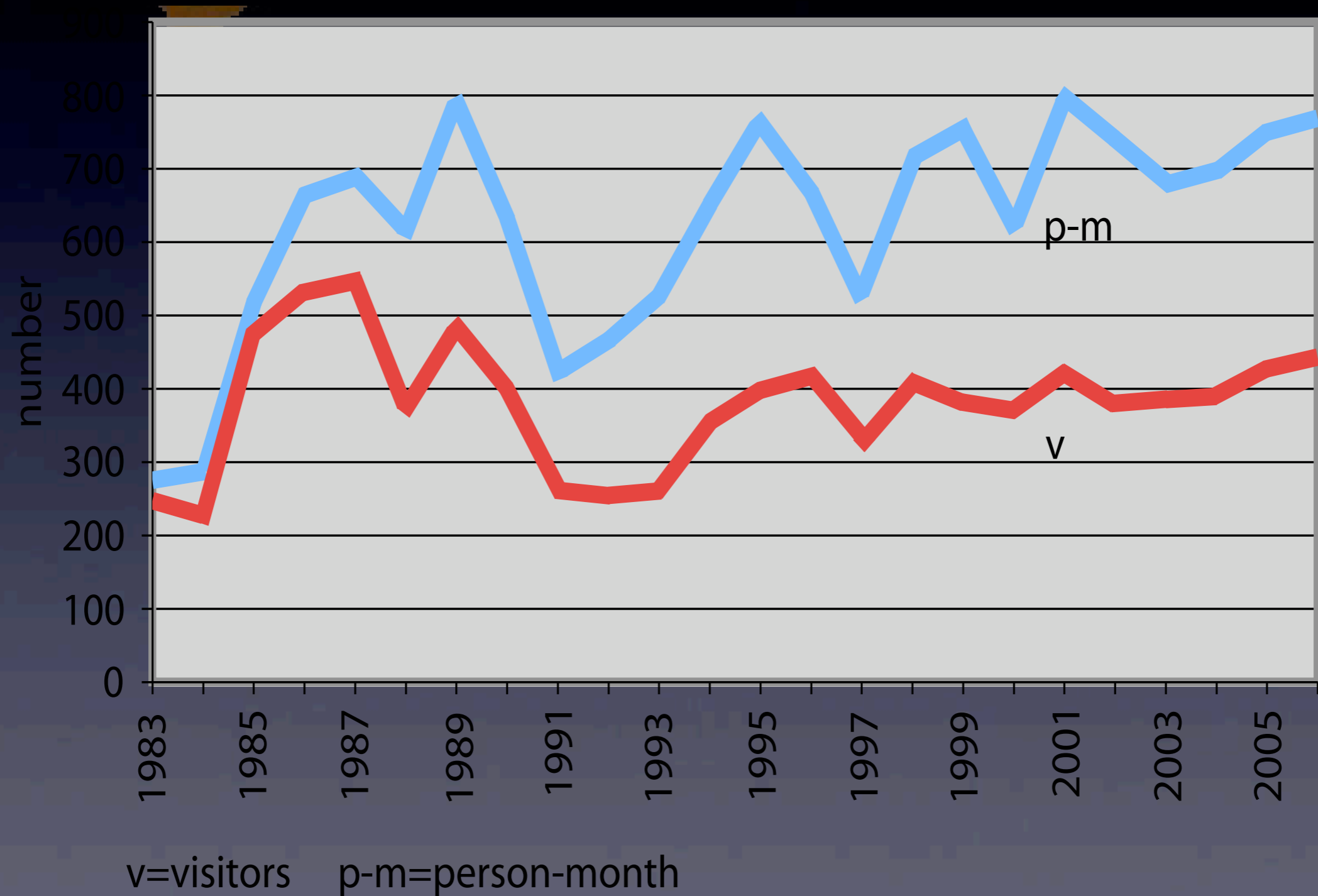
- più di 4000 scienziati
(6000 nel 2006)
- **~40 attività scientifiche**

per un totale di più di **100.000** visitatori (dal 1964), di cui

- 60% da paesi in via di sviluppo
- 40% da paesi già sviluppati



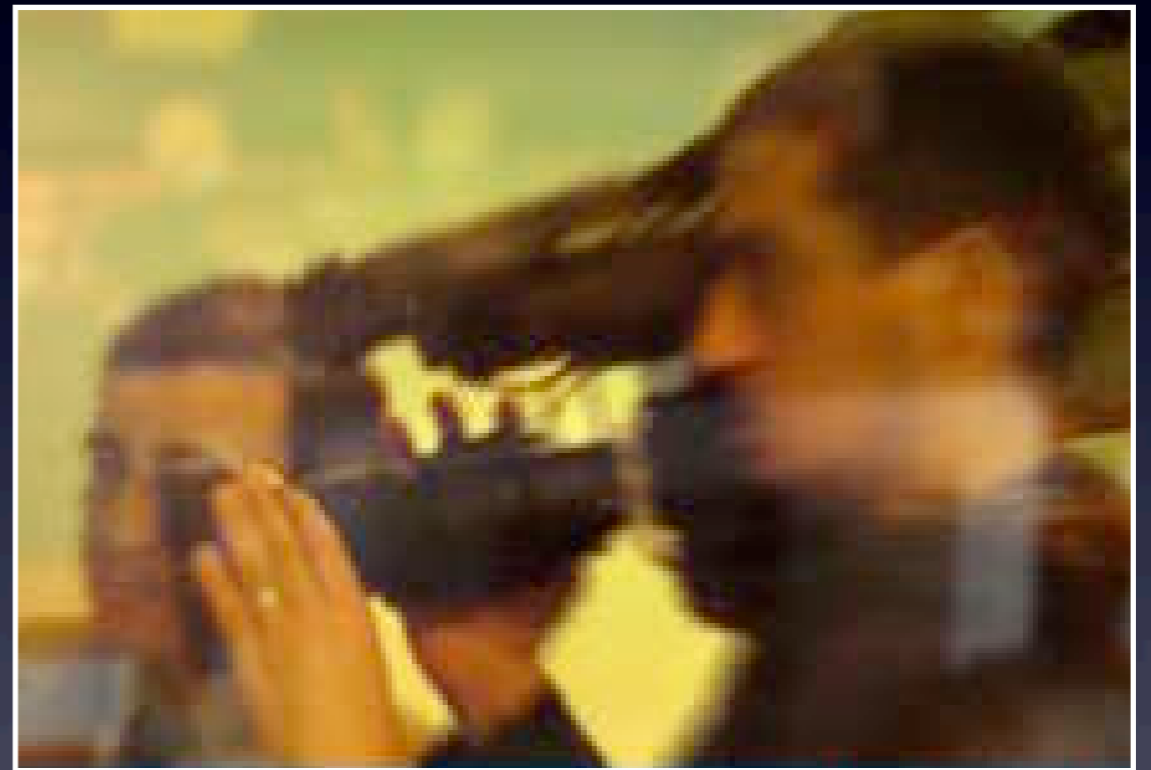
statistiche: visitatori dall'Africa



uscire dal Centro

La **Science Dissemination Unit (SDU)** dell'ICTP è stata costituita nel 2004 con l'incarico di disseminare nel mondo i contenuti scientifici e le attività dell'ICTP attraverso i mezzi elettronici (ICT, Internet), per raggiungere soprattutto gli scienziati e studenti che non possono visitare di persona il Centro.

Come riuscirci?



Internet è la soluzione

quanti scienziati possiamo raggiungere?

un esempio di “Fermi calculation”:

- 6.500.000.000 (popolazione mondiale)

di questi, quanti sono oggi connessi ad Internet (distribuzione non omogenea...) ???

- diciamo 5%

WORLD INTERNET USAGE AND POPULATION STATISTICS

World Regions	Population (2007 Est.)	Population % of World	Internet Usage, Latest Data	% Population (Penetration)	Usage % of World	Usage Growth 2000-2007
Africa	933,448,292	14.2 %	33,334,800	3.6 %	3.0 %	638.4% %
Asia	3,712,527,624	56.5 %	398,709,065	10.7 %	35.8 %	248.8% %
Europe	809,624,686	12.3 %	314,792,225	38.9 %	28.3%	199.5 %
Middle East	193,452,727	2.9 %	19,424,700	10.0 %	1.7 %	491.4 %
North America	334,538,018	5.1 %	233,188,086	69.7 %	20.9%	115.7 %
Latin America/Caribbean	556,606,627	8.5 %	96,386,009	17.3 %	8.7 %	433.4 %
Oceania / Australia	34,468,443	0.5 %	18,439,541	53.5 %	1.7 %	142.0 %
WORLD TOTAL	6,574,666,417	100.0 %	1,114,274,426	16.9 %	100.0 %	208.7 %

NOTES: (1) Internet Usage and World Population Statistics were updated on Mar. 10, 2007. (2) CLICK on each world region for detailed regional information. (3) Demographic (Population) numbers are based on data contained in the [world-gazetteer](#) website. (4) Internet usage information comes from data published by Nielsen//NetRatings, by the International Telecommunications Union, by local NICs, and other other reliable sources. (5) For definitions, disclaimer, and navigation help, see the [Site Surfing Guide](#). (6) Information from this site may be cited, giving due credit and establishing an active link back to [www.internetworldstats.com](#). Copyright © 2007, Miniwatts Marketing Group. All rights reserved worldwide.

Market Research, 24/7

Infiniti Research is a leading Intl bespoke market research company.
www.infiniti-research.com

Global Telecoms Sector

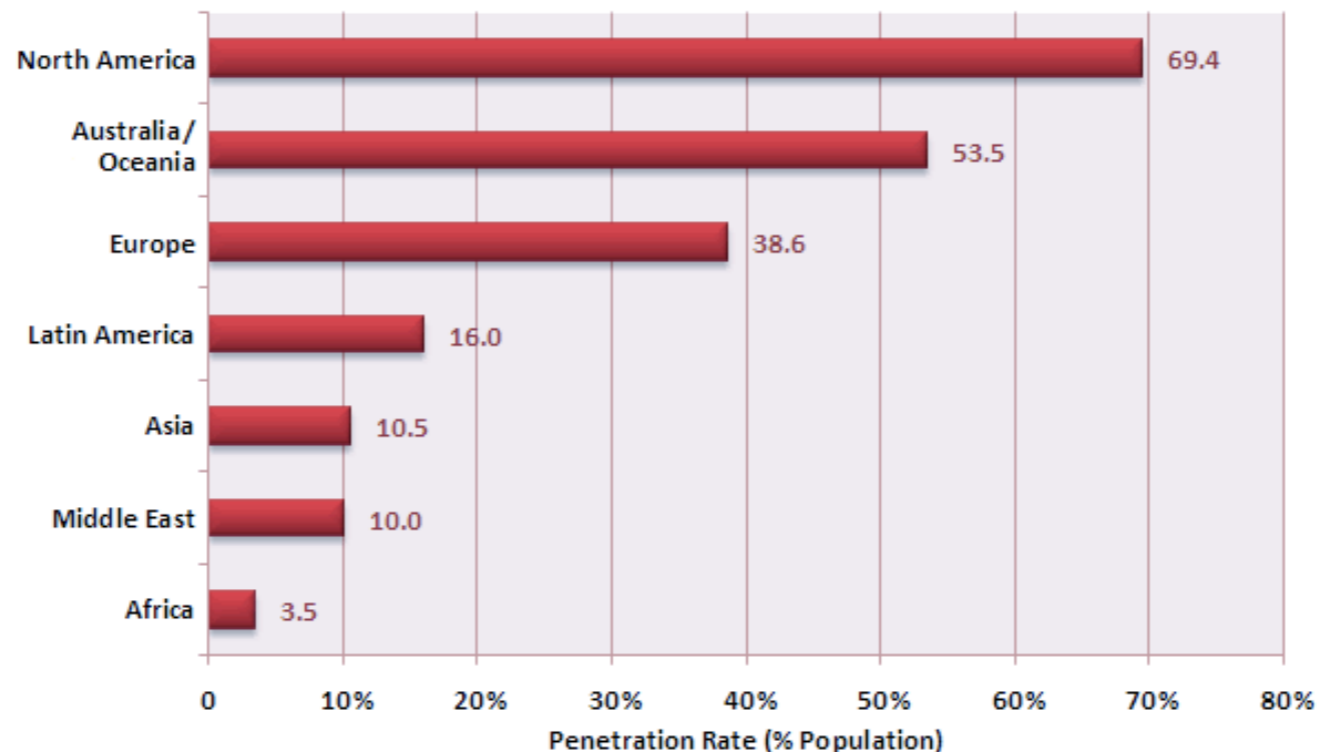
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Internet Penetration by World Region



quanti scienziati possiamo raggiungere?

un esempio di “Fermi calculation”:

- 6.500.000.000 (popolazione mondiale)

di questi, quanti sono oggi connessi ad Internet (distribuzione non omogenea...) ???

- diciamo 5% = 325.000.000

- quanti sono poi scienziati/studenti ?

0,3% = ~1.000.000 scienziati hanno Internet

il problema

“Our research so far has shown that making streaming video presentations accessible - increases **staff time** by an additional factor of up to fifty.

The cost of **outsourcing** this service at 100% content accuracy is about **\$250 to \$350 per hour** of video.”

[<http://www.utexas.edu/computer/grants/di4/cit/cit.html>]



il problema

“...that the key problem of recording is that it is necessary to have **one person in the room** to follow the lecture/recording equipment or even **3 or more persons** depending on the number of lectures going on simultaneously.”

noi abbiamo **3** aule per i corsi del Diploma Programme e **6** principali Sale Conferenze (40-300 posti) sparse nel campus.

$$9 \times \$300 = \mathbf{2700 \$/ora}$$



condizioni al contorno

Lezioni e seminari tenuti da fisici e matematici implicano l'uso (non prevedibile in anticipo) di:

trasparenze, lavagna, PowerPoint, animazioni, etc.

Oltre a questo, la notazione matematica è sempre presente, e anche un punto può essere essenziale (x, x', \dot{x}, \ddot{x}).

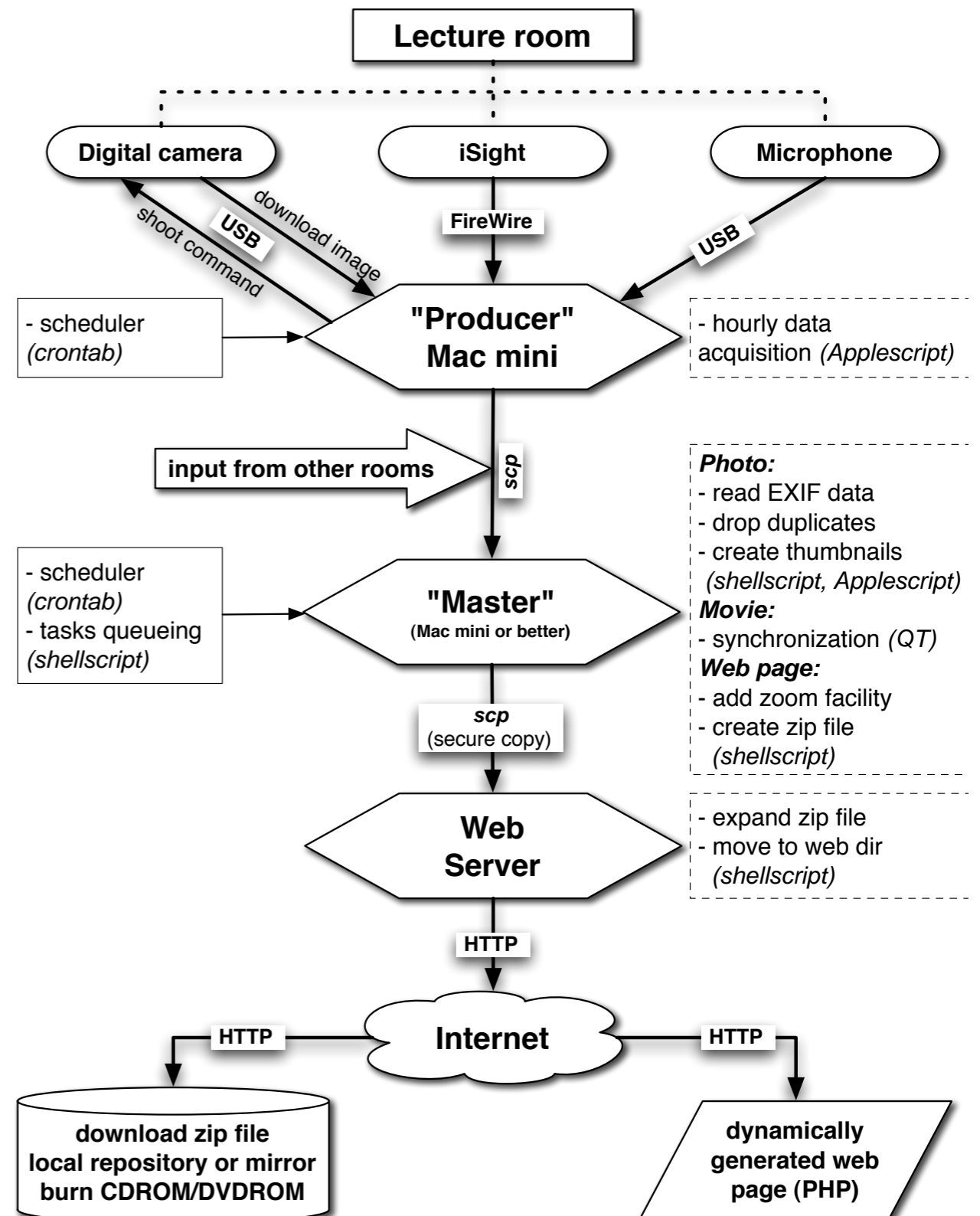
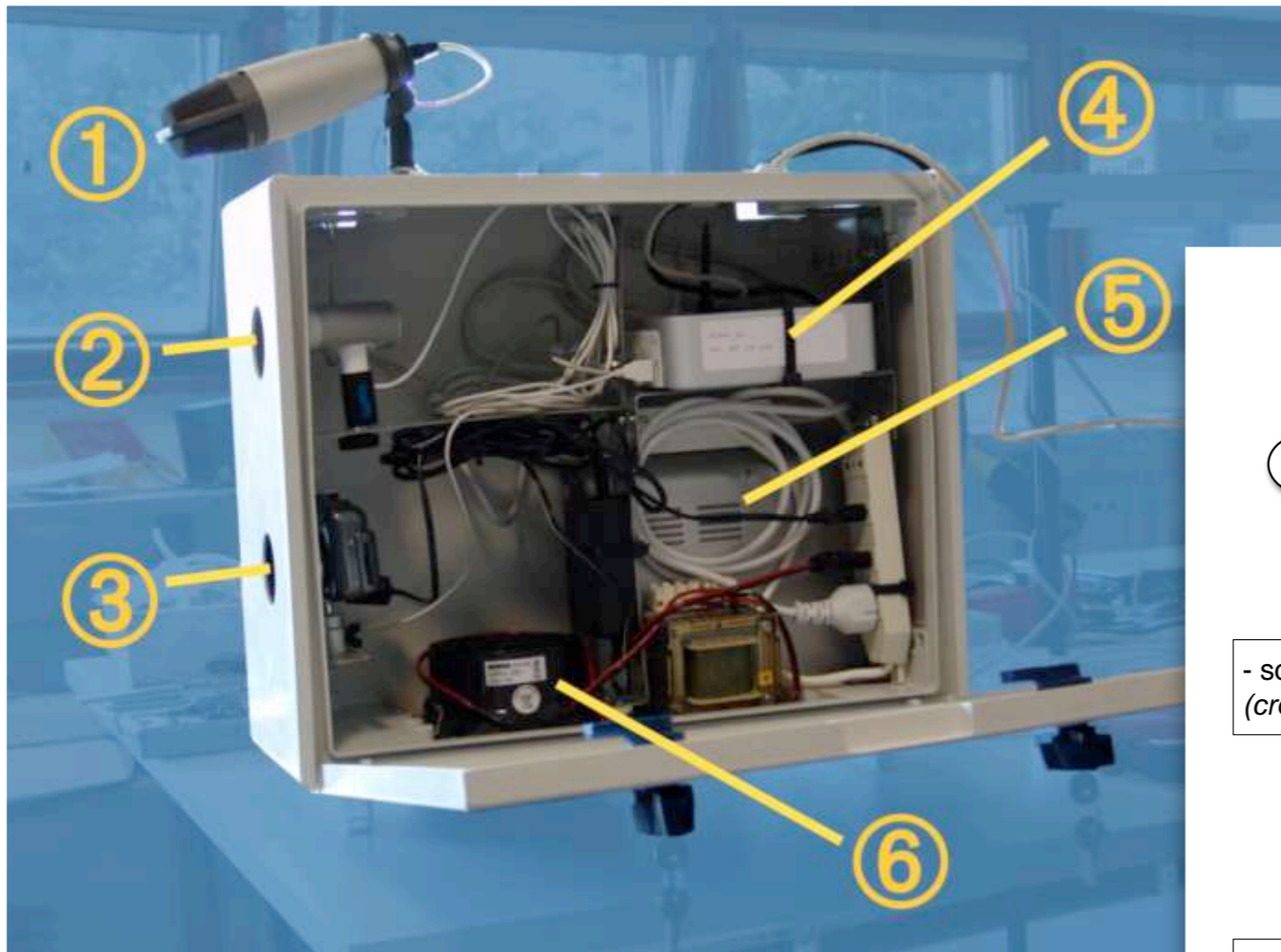
John Nash all'ICTP nel 2004



Il nostro approccio

Costruire un sistema di Digital Lectures che abbia queste caratteristiche:

- nessun intervento umano durante la registrazione, il post-processing e la pubblicazione nel web
- nessuna costrizione o richiesta particolare per il docente/oratore
- basso costo di implementazione e manutenzione
- immagini ad alta risoluzione
- architettura scalabile (da un aula fino ad un campus intero)
- fruibilità in condizioni di connettività limitata (download come archivio zip + distribuzione tramite CD/DVD)



```

if test $SLIDEOFFSET_ALLSEC -ge $T_LENGTH_SEC # when the slides are g
.
then echo "* WARNING on image $A.jpg: Offset is $SLIDEOFFSET_ALLSEC
th of the movie. This slide will be discarded." >> "$LOG_FILE"
  if [ $LASTA -eq $SLIDES ]
    then LASTA=$A # if we did not changed it before (i.e. this is
he movie), let's change it now
  fi
  rm -f "$S_PATH/$A.jpg" # delete the small image file
  rm -f "$OUT_PATH/big/$A.jpg" # delete the big file
  continue # go to the next iteration of the loop
fi
  
```

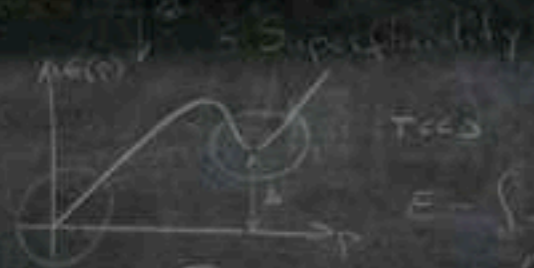
```

SLIDEOFFSET_SEC=$(echo "scale=0; $SLIDEOFFSET_ALLSEC % 60" | /usr/b
SLIDEOFFSET_SEC="00$SLIDEOFFSET_SEC" ; SLIDEOFFSET_SEC=${SLIDEOFFSE
SLIDEOFFSET_MIN=$(echo "scale=0; ($SLIDEOFFSET_ALLSEC/60) % 60" | /
SLIDEOFFSET_MIN="00$SLIDEOFFSET_MIN" ; SLIDEOFFSET_MIN=${SLIDEOFFSE
SLIDEOFFSET_HOURS=$(echo "scale=0; ($SLIDEOFFSET_ALLSEC/3600) % 60"
SLIDEOFFSET_HOURS="00$SLIDEOFFSET_HOURS" ; SLIDEOFFSET_HOURS=${SLID
  
```

Enhance your Audience (EyA)

- ▶ durante la lezione/conferenza:
 - registrazione audio/video
 - si scattano anche foto del “muro”





- 1) Superfluid II
- 2) Went into BEC
- 3) Magnetism III

$$E = \int \frac{E_p}{e^{E_p/kT}} p^3 dp$$



$$N_{10} = e^{-\frac{E}{kT}}$$

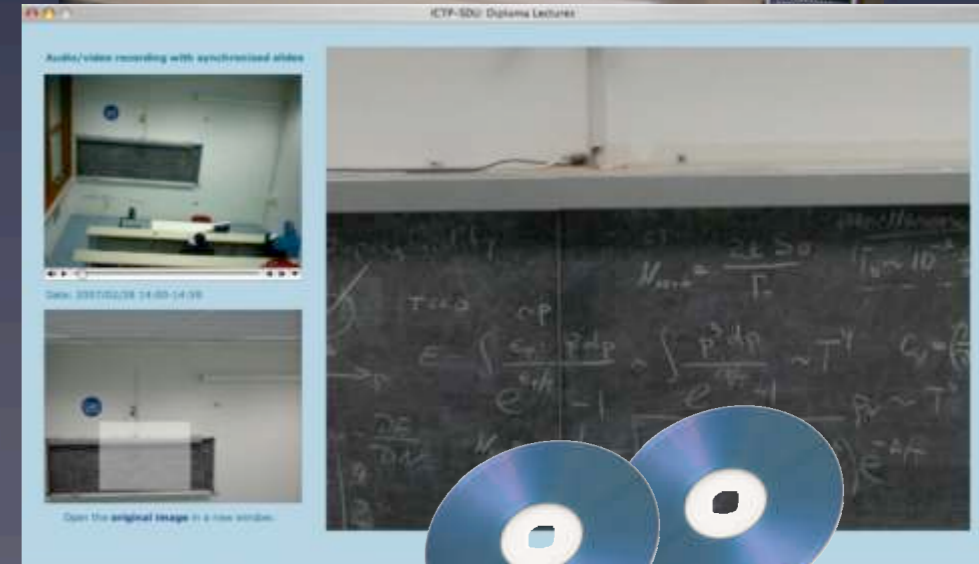
Heiliger's law / continuity

$$N_{cond} = \frac{2L S_0}{\Gamma} \left(\frac{10^{-3} \text{ cm}^3}{\text{mol}} \right)^{1/3}$$

$$C \sim \left(\frac{2}{T} + \frac{0}{T} + \frac{(\Delta)^2}{T} \right) e^{-\Delta/kT}$$

Enhance your Audience (EyA)

- ▶ durante la lezione/conferenza:
 - registrazione audio/video
 - si scattano anche foto del “muro”
- ▶  **nessun intervento umano!**
- ▶ sposta i files al server per processarli
- ▶ immediatamente dopo la lezione:
 - sincronizzazione delle foto (slides, lavagna, ...) con il video
 - creazione pagina web (+ zip file)
 - creazione di eventuale CD/DVD
- ▶  **nessun intervento umano!**



costi

- **basso costo** di sviluppo (già fatto)
- **basso costo** di installazione
~ 2500 €/aula
2 – 5000 € per servers
- **minimo costo** di gestione e manutenzione (*vanno sostituite le macchine fotografiche digitali in caso di rottura*)



tecnologie

- Apple computers (OSX)
 - ➔ **QuickTime,**
Applescript, shell, ...
- ottimizzazione
 - ➔ comparazione delle
immagini per
eliminare ridondanza
- dati EXIF
 - ➔ per sincronizzare
foto e video





Basic Physics

new one-year Diploma Programme

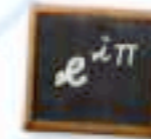
[View the courses](#)



High Energy Physics

one full year, pre-PhD level

[View the courses](#)



Mathematics

one full year, pre-PhD level

[View the courses](#)

Condensed Matter Physics

one full year, pre-PhD level

[View the courses](#)



Earth System Physics

one full year, pre-PhD level

[View the courses](#)



From September 2007, all lectures given within the ICTP Diploma Programme are being automatically recorded using the new [EyA technology](#) developed by the [ICTP Science Dissemination Unit](#). The access to this digital material is made here available to the public.

This project aims to enhance ICTP's mandate of transferring knowledge to scientists from developing countries. It is our hope that these public recordings will be useful for students as well as lecturers beginning their teaching careers in science.

For more information about the courses, including the schedule of lessons, please visit the [website of the Diploma Programme](#).

Disclaimer: ICTP publishes these lectures on the web and distributes them in digital form only for educational purposes. It will not endorse or sponsor any commercial product, service or activity, and does not permit the recorded material to be used for commercial purposes.

v1.0



Diploma on

www.ictp.tv

[Go back to the Main Page](#)

select diploma course

- [← Basic Physics \(BP\)](#)
- [← High Energy Physics \(HEP\)](#)
- [← Mathematics \(MTH\)](#)
- [← Condensed Matter Physics \(CMP\)](#)
- [← Earth Systems Physics \(ESP\)](#)

archives

- [← last year \(password required\)](#)
- [← other recordings](#)

resources

- [← www.ictp.tv](#)
- [← Main ICTP Website](#)
- [← About EyA](#)

DIPLOMA COURSE IN MATHEMATICS (MTH)

LECTURES ON CALCULUS ON \mathbb{R}^n

A total of 28 hours was found for this topic.

Complete list, in reverse chronological order ([invert](#)):

HOURL 27&28 (2007.09.28)

Lecturer: O. Shatalov



Hour 27: 14.00—14.59 (room "H")

Download a [zipfile](#) (180.9MB)
or [View now](#) (local users only)

Notes: tutorial



Hour 28: 15.00—15.59 (room "H")

Download a [zipfile](#) (168.1MB)
or [View now](#) (local users only)

HOURL 25&26 (2007.09.28)

Lecturer: O. Shatalov



Hour 25: 09.00—09.59 (room "D")

Download a [zipfile](#) (200.6MB)
or [View now](#) (local users only)



What kind of recording is it?

More than just video.

ictp.tv is based on a new technology developed at ICTP: it synchronizes the audio/video recording with a sequence of high-definition pictures (refreshed every 15 frames) at the finest detail and



Q.: Can't you improve this?

A better ictp.tv to satisfy your needs.

We are working to enhance our EyA software engine with new great features:

- video streaming
- end of download
- Flash format,
- even a podcast mp3 player.



Bandwidth requirements

Q.: does ictp.tv require a fast network?

Faster network connections, like DSL or similar, allow faster download of ictp.tv recordings.

As an example, it will take ~7 minutes to download one



Technical requirements

Q.: what is needed to see ictp.tv?

To view ictp.tv, the free Apple QuickTime plugin is required (available for PC and Mac).

Any web browser should work fine; we recommend MS Internet Explorer, Safari or Mozilla/Firefox.

About EyA

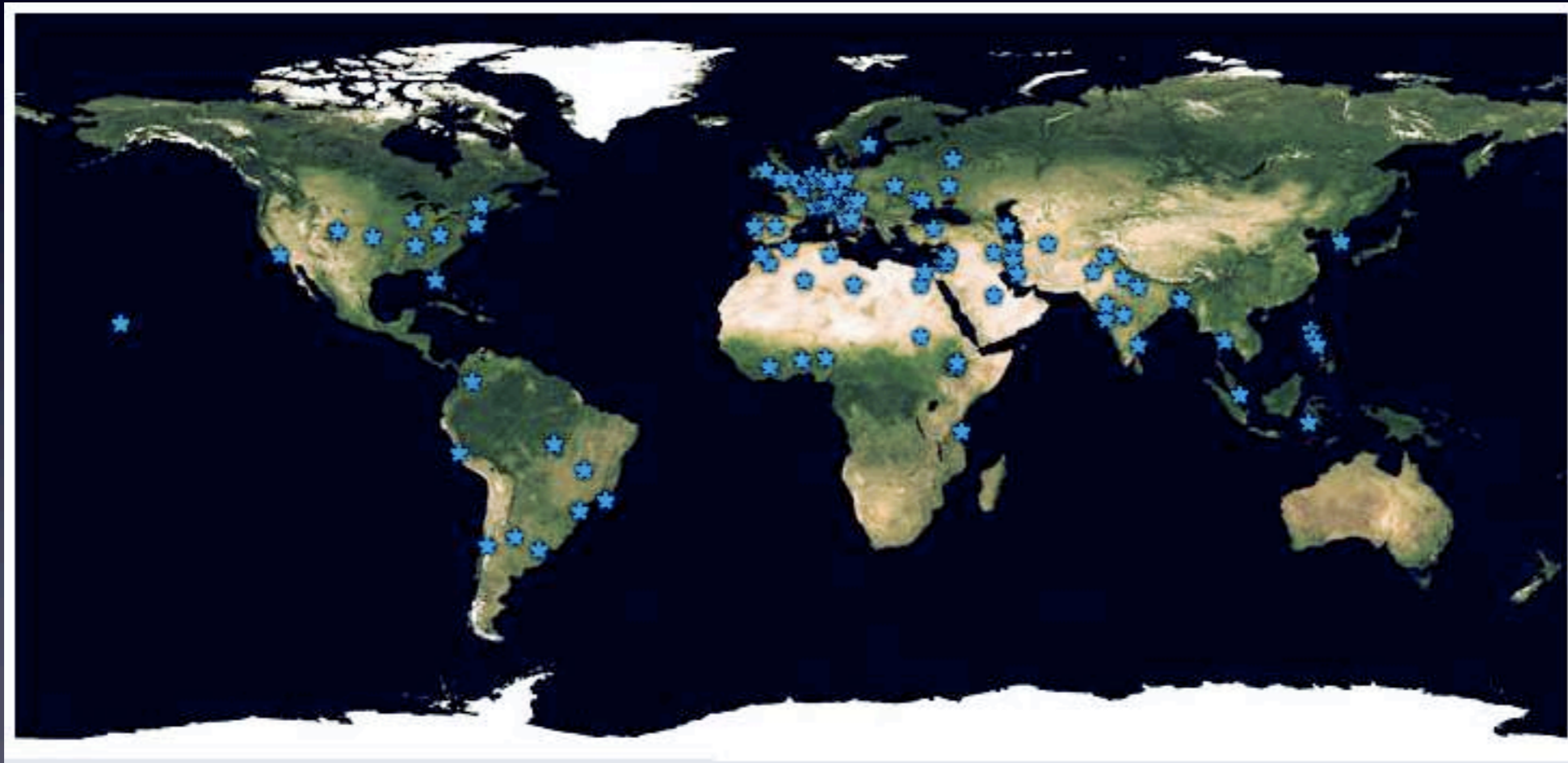
EyA ("Enhance your Audience") is an innovative automatic audio/video/slide recording system, developed to archive and share scientific lectures and talks carried out using modern presentations (PPT, PDF, animations, etc.), as well as the traditional chalkboards found in classrooms.

The EyA system has the following main features:

- no human intervention during recording and post-processing;
- scalable architecture;
- no special requirements for the speaker or lecturer;
- high resolution of images;
- low total cost of ownership and implementation;
- low-bandwidth friendly features (zip, CD, DVD).

[More info.](#)

visitatori del sito web



grazie per l'attenzione!



per info: sdu@ictp.it

www.ictp.tv



$\int du^{(EyA)}$